Red Chris
an Imperial Metals company
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ENVIRONMENTAL MEMORANDUM

Date: Aug 23rd, 2016

Distribution: Red Chris Monitoring Committee
Cory Koenig, Jason Nole, Shawn Ducharme , and Chantel Quock

From: Jack Love, Environmental Superintendent

Re: Red Chris Monitoring Committee Environmental Report August 9- 23rd, 2016

Weather:

Temperatures ranged from 0°C to 21°C. There was alternating overcast and sunny periods throughout this shift. August 12-15th had hour long durations of high precipitation. In the mornings, there were frozen windshields in the second half of this shift which was evidence of fall arriving.

General Activities:

- Regular mining and blasting in the pit.
- Pit dewatering into upper Thurston's Trickle sump W77.
- Regular blasting occurred in the pit, phase 3 and TIA rock quarry areas.
- Initiation of stripping and remainder of logging continues in the South TIA dam construction with congested works area.
- Many different contractors on site aiding dam construction and general mine construction activities.
- RCDC environmental staff continues to support al relative contractors and monitor the main south and south reclaim dam installations.

Spills and Incidents:

- There were 2 minor spills were reported and cleaned up in the upper mine footprint. Both spills were >5L each and contaminated spill pads/soil was disposed of correctly.
- 50-60L major spill in the south TIA near coffer dam #1 reached ground but not any watercourses. Collaborated efforts by the pit shop, TIA crew, North American and TNDC helped have this contained in a timely fashion. Contaminated soil was brought to the designated 18.5km laydown.

Water Management:

- South TIA- Daily inspections of the construction activities in the South Dam and Reclaim Dam areas. Water quality confirmations and management,
- spill response supplies on site
- Fish salvage and live transportation completed.
- Lakes monitoring and sampling commenced August 22nd to August 25th on Todagin and Kluea lakes. There was an extensive amount of samples taken from 11 sites combined in both lakes. This intense sampling included lake sediment, aquatic invertebrates, plankton, rainbow trout tissue sampling and numerous water samples collected from each site to continue the collection of baseline information.
- Monthly surface, drinking and rock storage area (RSA) water samples were obtained and sent for analysis.
- Quarterly surface water sampling was completed August 24th.
- Water samples collected from the South TIA coffer dam areas.

Soil Management:

- Ensured removed top soil from South TIA dam and reclaim dam areas were properly placed and sloped as per the CMP(Construction Management Plan)

Archeology: Baseline Archeology crew arrived on site inspecting the recent chance finds in the South TIA. Baseline crew also inspected the upper south TIA east side area past MW13-1 for evidence of obsidian through the proposed road section to Kluea lake. Inspections were also conducted in the lower Trail creek/Kluea Lake wetlands for evidence of historical use and obsidian finds.

Wildlife:

- 2 weasels were spotted near coffer Dam #4 in the south TIA.
- A muskrat was observed in the wetland area south of Black Lake.
- Various waterfowl daily in Black Lake,(buffleheads, mallards, sand pipers).
- 2 different Osprey were seen flying from Kluea Lake over the South TIA area, one had a rainbow trout in its talons.
- Bald eagles were spotted near Kluea and Todagin lakes.
- Heard wolves howling on the south side of Todagin lake Aug 22nd.

Waste Management:

- Contaminated soil complex obtained final approvals and is being installed at 18.5km prior to winter. In the interim, a 5th contaminated soil location was built to store the above mentioned contaminated soils.
- Removal of used oil totes commenced on August 15th by GFL.
- Overall General Waste Area objectives are being met and followed by RCDC and onsite contractors alike.

Photos:

Existing location of where weir 4 will be placed after some adjustments.

Weir 5 will be added just above the Camp/Trail cr. Confluence on the right side channel.

South dam footprint stripping started.

Coffer dam #6 being constructed.

Installation of liner for coffer dam #6.

One of only a few trees left to be logged inside the south dam footprint.

Saddle dam on the right.

North dam construction continues.

3600 excavator moving to be serviced.

Coffer dam #2.

A dragonfly larvae *odonatan sp.* found in reach #7.

Coffer dam 1 spill cleanup.

Black Lake receded to a small area.

Stripping above coffer dam #3 resulted in additional E&SC installations.

A second sediment fence was installed to improve the turbidity above coffer dam 3.

Coffer dam #3 showing the west and east groundwater influences.

South TIA-Coffer Dam 4 U/S is free of water.

Stripping below CD-4 did reach groundwater in the channel.

No flows have commenced below coffer dam 5 to date

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A view of the central area of camp.

Trail creek at surface water site W33.

Looking north from the north side of the south reclaim dam toe-Showing the difficulty of construction against eastern valley slope.

Sample site W4 remains dry.

South TIA reclaim area showing groundwater in valley bottom.

Below coffer dam #6-sump dewatering efforts continue.

Coffer Dam #6 on Thurston's Trickle will need further construction to capture more groundwater.

One of a few remaining small pools of groundwater to be pumped above coffer dam #3.

Coffer dam #3 volume capacity was added to help control the west hillside toe groundwater.

Stripping activities above Coffer dam #2- daily turbidity readings being collected.

Below Coffer dam #4-stripping resulted in groundwater showing on surface where Trail creek channel is.

Coffer dam #1- looking towards Black lake.

Black lake- looking northeast toward northeast arm drainage.

Black Lake- west side logging and stripping continues.

Gayleen Day Tahltan Archeaology Team investigating lithic scatter found on-site

Coffer dam 5 still dry.

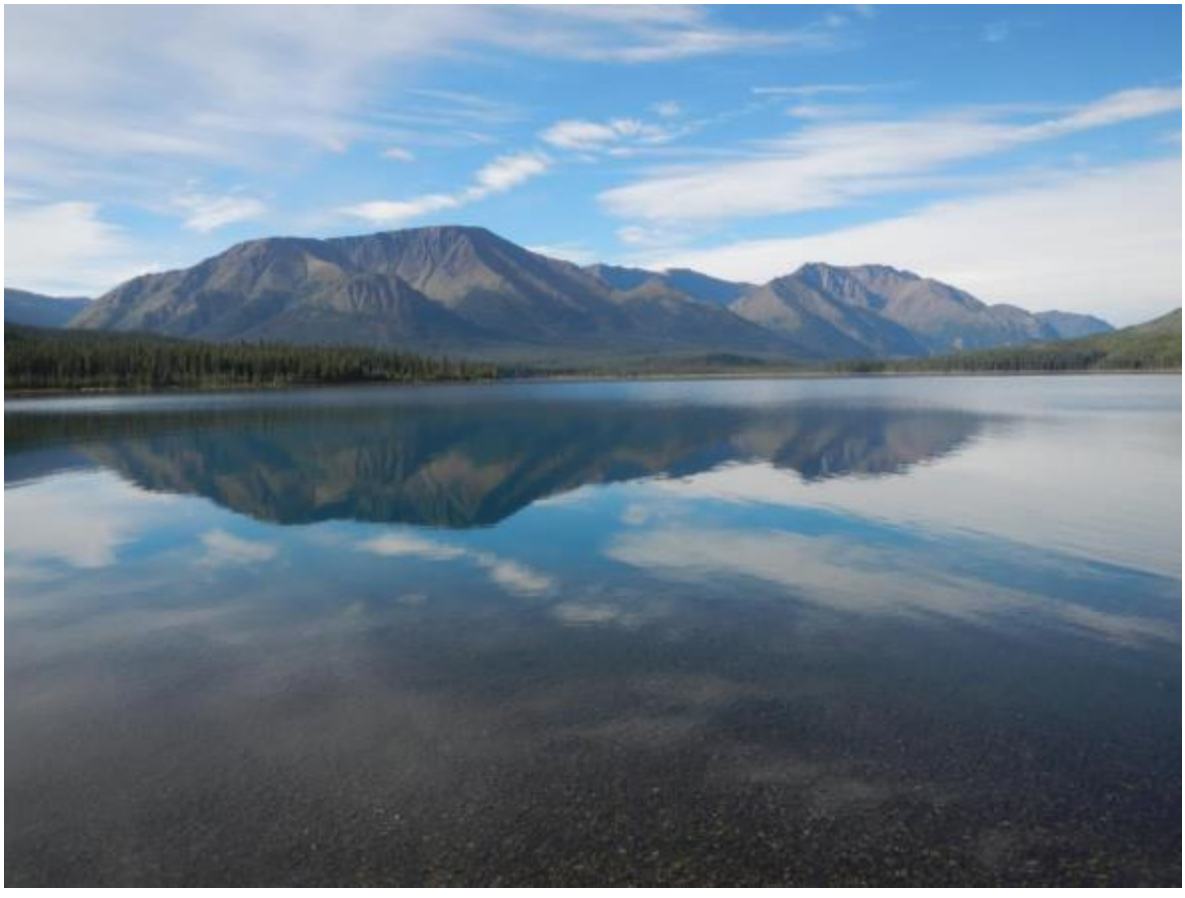
TIA and saddle dam.

Moving the boat from Todagin lake to the south of Kluea lake.

Beaver dam at the rear of Kluea lake near surface water sampling site W15.

Kiniskan Outfitters' horses roaming free between Kluea and Todagin lakes.

Outfitter horses



Todagin lake looking southwest.

Wolves finished howling and the fog just lifted from Todagin lake.

TIA.

Looking north from Kluea lake into the Trail creek valley and south TIA area, TIA is in the far background.

Kluea lake looking north from Todagin lake.

Kluea lake south kicknet efforts benthi invertebrate tissue samples.

Tailings storage area, Saddle dam, Black Lake and Northeast Arm.

Coffer dam #2 catchment receiving groundwater during stripping.

Coffer dam #3 from the chopper.

Looking north from Coffer dam #1 towards receding black lake and the TIA.

Kluea Lake was flooded by a south beaver dam, leaving all landing sites under water.

Angling from shore at Kluea lake was not as productive as trolling.

Goats spotted on the northern face inside the Todagin management area.

Visible conveyor and Mill from Kluea Lake site K5.

Zooplankton sample from a 200m horizontal tow in Kluea lake.

Slowly deploying the eckman grab to site K9.

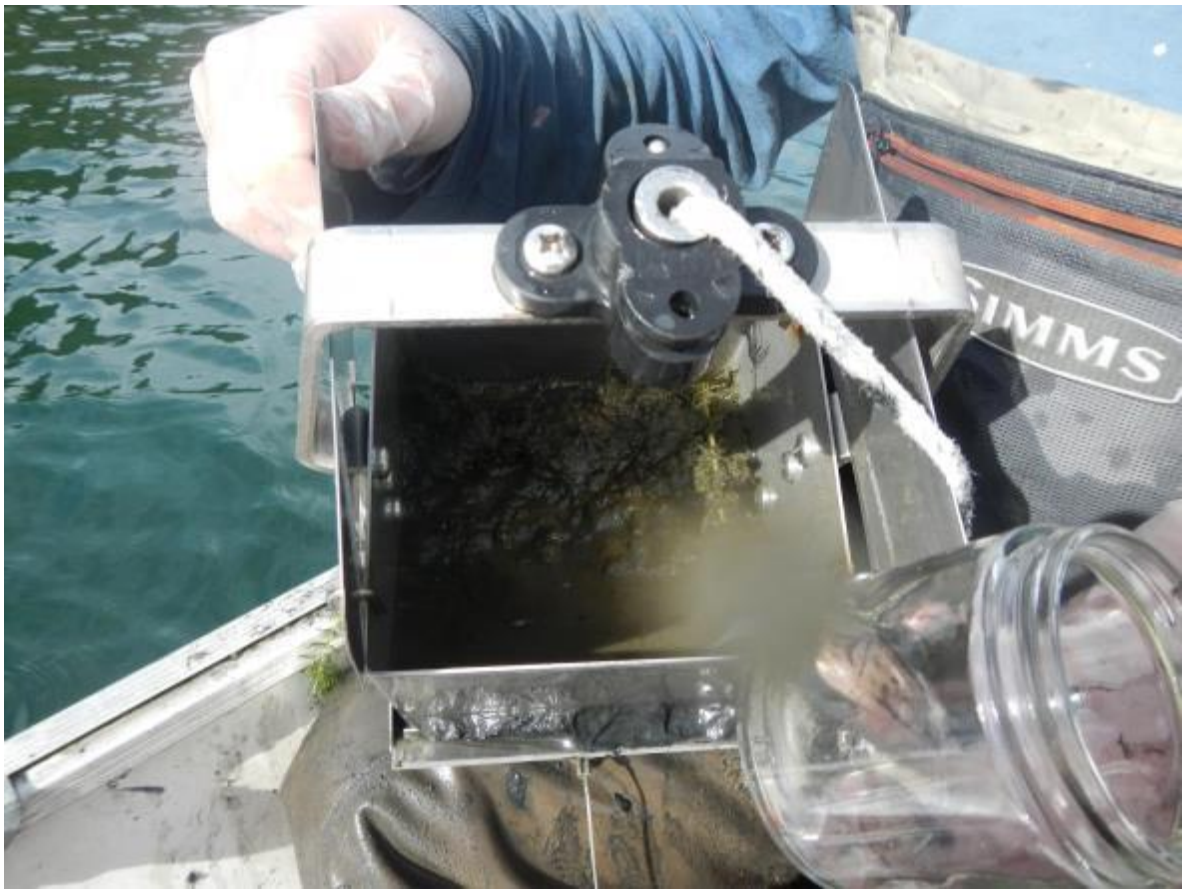
Chronomids were observed at the deep lake sites on Kluea lake.

Sediment sample from one of the deep sites at K8.

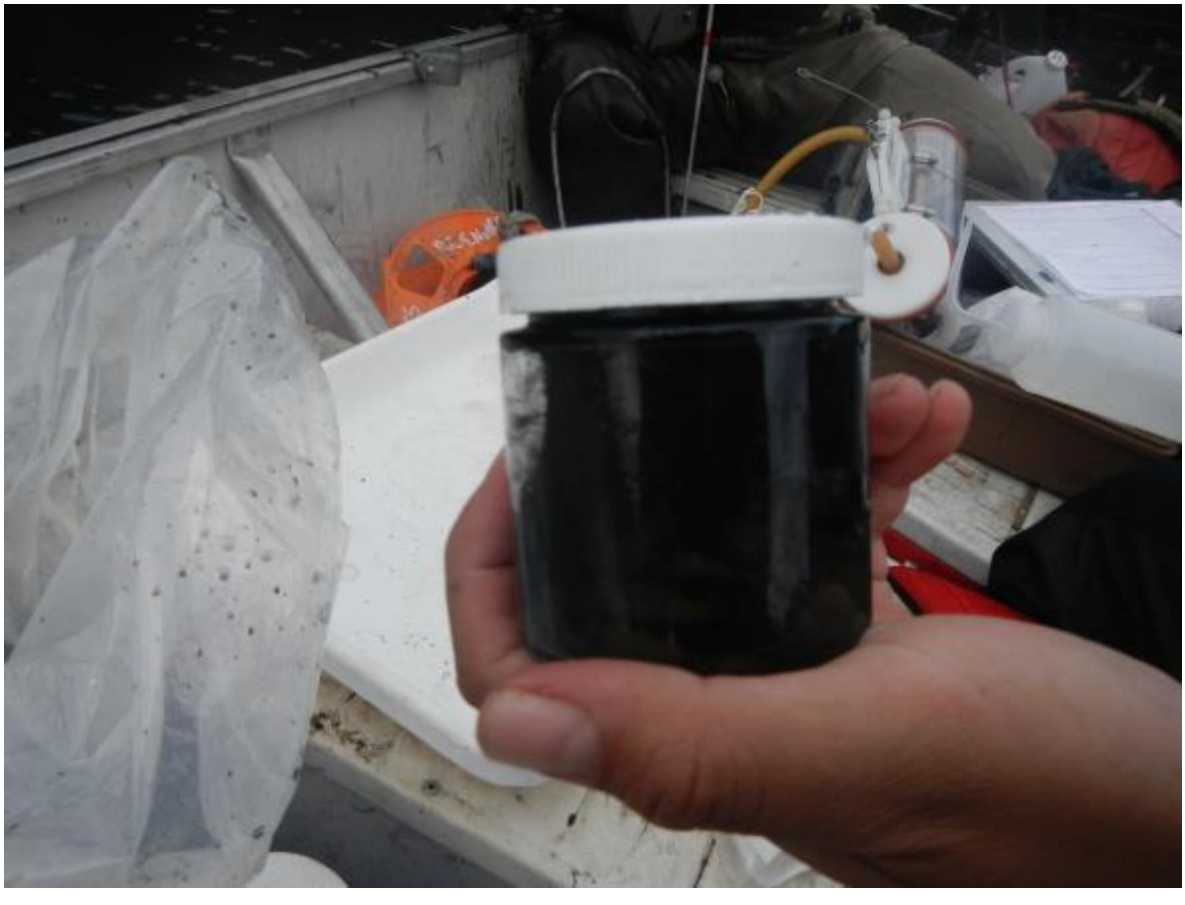
Collecting zooplankton with a Wisconsin net vertical tows.

On route to a new site location at a snails pace.

Moving the boat to an area that is not flooded.



Some sediment was difficult to collect from the shallower sites



Sediment sample from Kluea lake site K5.

Conducting a timed transect to collect Gammarus shrimp for presence of metals.

Many smaller Gammarus shrimp.

Gammarus shrimp substrate habitat on the north shore of Kluea lake.

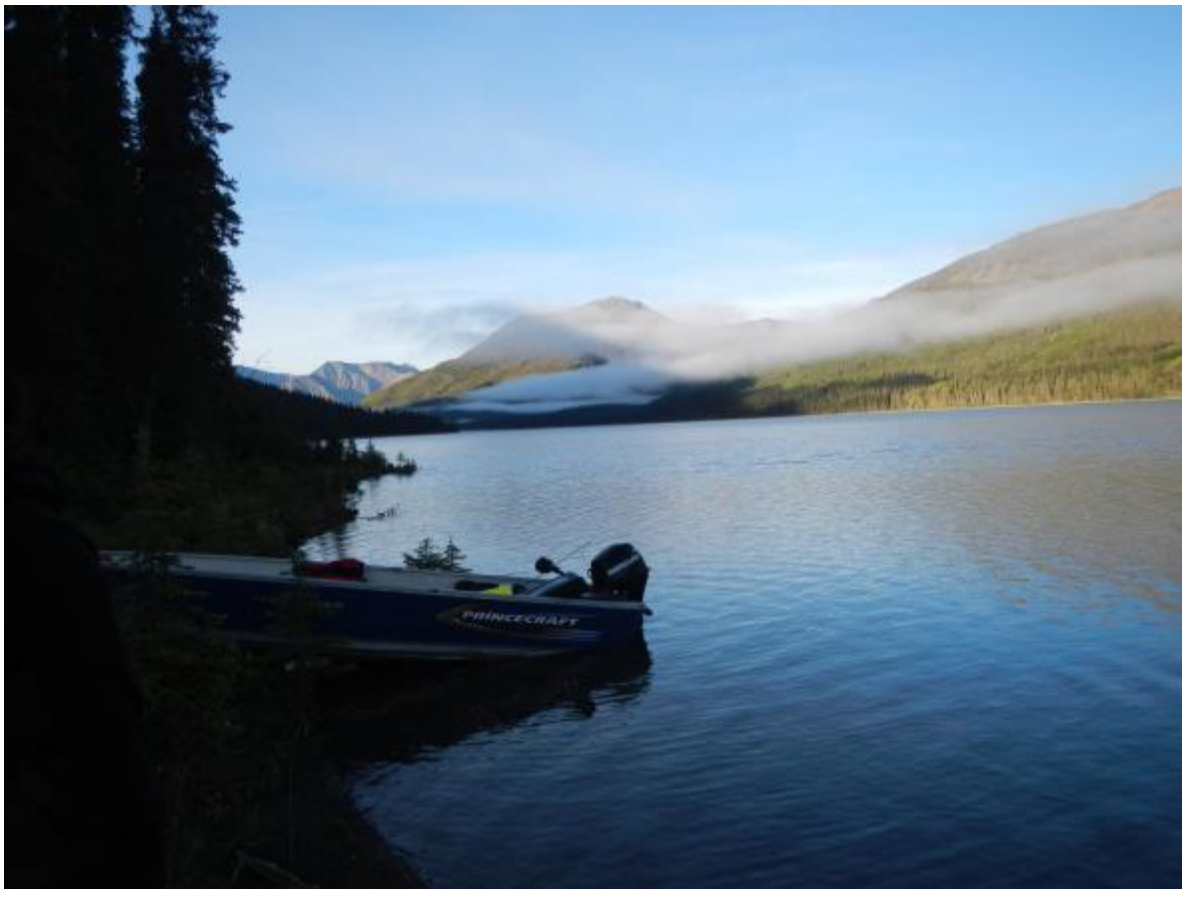
Placing the final shrimp into the sample bag.

The end sample, trace metals analysis in secondary producers for bio accumulation model.

500 Kluea lake gammarus shrimp that was equivalent to 10.4 grams.

Pre-labelling and organizing before we head out to the last 6 sites.

Last long day to complete the lakes study data.



Kluea lake sampling was slowed considerably by the higher-than-average lake level and frequent site relocating.